

**Notes from the October 15, 2019 conference call with EPA regarding August 18, 2019
EPA comments on the *Quality Assurance Project Plan Addendum Revision 1* [for the
Baseline Ecological Risk Assessment (BERA)] dated November 13, 2018.**

Form C: Problem Definition

- The problem definition should include a discussion of the following:
 1. The fact that the BERA will be looking at surface water and sediment exposure pathways. Additional discussion regarding direct exposure to biota in the aquatic water column and benthic habitats should be included as well.
 2. How the contaminants of concern (COCs) are/were transported to surface water and sediment media.
 3. Bioaccumulation potential of Pb, Cd, and PCBs and the need for food chain modeling.

Notes: As requested by EPA, this section will include additional discussion (i.e., a few paragraphs each; not an in-depth analysis) of exposure potential, how COCs might be transported, and bioaccumulation potential.

Form D: Project Description

- Two sets of background samples are needed: One set for the Upper Shoe Pond and one for the Lower Shoe Pond. TPH and PAHs need to be retained as COCs for sediments.

Notes: Refer to Form E for discussion regarding background sampling.

- ***Third paragraph, page 11***

Models are mentioned but the specific models being referred to are not. Is the EqP model the model in question? Please include a description of the model used and how it was carried out to support the statement in the paragraph.

Notes: EPA asked for additional specificity, but the parties agreed to delete paragraphs in this section that referred to the 2011 SLERA and that many SLERA conclusions are not being adapted into the scope of work for the BERA.

- ***Fourth paragraph, page 11***

AVS/SEM fraction organic carbon (fOC) on its own is not a definitive stand-alone tool according to EPA Region 1. Among the known uncertainties, these predictions need to be verified and used in conjunction with the interpretation of chronic sediment toxicity testing results.

Notes: We acknowledge that AVS/SEM (if used) would constitute a single line of evidence.

- **Fifth paragraph, page 11**

Regarding the elimination of cyanide, EPA does not believe it appropriate to use 25-year-old data to inform the current situation. What were the reporting limits in 1988? Additionally, it is indicated earlier in the QAPP that four samples were collected in the 2011 sampling. Two detects is a 50% frequency of detection (FOD), so EPA cannot support its dismissal as a contaminant of potential environmental concern (COPEC).

Notes: Portions of Form D can be deleted where they refer to the 2011 SLERA, since many SLERA conclusions are not being adapted into this scope of work for the BERA.

- **First paragraph, page 12**

EPA Region 4 ecological risk assessment guidance has TPH benchmarks that could be used for screening. EPA had recommended that EPHs (high molecular weight PAHs) be retained. The MassDEP EPH assessment tool should be used for screening.

Notes: We questioned whether this “assessment tool” is: BATTELLE, September 2007, Sediment Toxicity of Petroleum Hydrocarbon Fractions. Prepared for: Massachusetts DEP Office of Research and Standards. EPA will verify with EPA risk assessor and send us the Region 4 guidance.

- **Third bullet, page 13**

While you certainly can include the toxicity testing protocol in this QAPP, EPA suggests you wait until you have all the sediment chemistry sampling results. At that time, you can decide the best location to include in the test and the proper test reference locations.

Notes: We discussed co-locating chemistry and toxicity samples to ensure that by subsampling from the same sample, we know the chemistry of the toxicity samples, rather than doing chemistry analyses and then resampling, where resampling at the precise locations of the chemistry samples is not practical. Enthalpy Laboratory (formerly EnviroSystems) reports hold times of up to 8 weeks (sometimes more, depending upon COCs).

We discussed using chemistry results to select samples for toxicity testing across a concentration gradient. EPA agreed that such an approach is an appropriate way to deal with the selection of samples on which to run toxicity tests. EPA acknowledged that by sampling in two rounds (chemistry then toxicity testing) the schedule would be delayed.

We discussed seasonal limitations as well as health and safety. EPA agreed that worker safety is paramount.

- ***Ecological Investigation, page 13***

In previous review comments EPA suggested at least 6 sample locations in the Upper Shoe Pond. Figure 7 shows 3 in Upper Shoe Pond and Figure 6 shows 4 samples in the Lower Shoe Pond. EPA thinks it reasonable to add at least 3 more sample locations in the Upper Shoe Pond given the size of the water body (14 acres). Additionally, as suggested in EPA's 2012 comments, we suggest waiting on toxicity testing to the results of bulk chemistry analysis.

Notes: We will clarify and correct figure labelling and reconcile samples and tables.

- ***Risk Characterization, page 13***

Please include in the QAPP how the risk assessment is going to be performed according to EPA processes and recommendations, step by step.

Notes: As requested, this section will include additional discussion explaining how we will follow EPA Risk Assessment guidance. We envision a broad, one paragraph, (not a highly in-depth) discussion.

Form E: Sampling and Analysis Plan

- ***Background, page 15***

In the second to last sentence, include the date that the EPA review comments were provided (May 4, 2012). In the last sentence, add that additional clarification was at the request of Cummings Properties.

Notes: Clarifying language will be added.

- ***Proposed Work Plan 1.d., page 15***

This sediment information and substrate composition information should be used in determining the appropriateness of background locations. The results of the reconnaissance need to be incorporated into the BERA.

Notes: EPA expects us to evaluate how background and site concentrations compare.

- ***Revised ecological conceptual model ("ECM"), page 16***

Please include an exposure pathways diagram.

Notes: A figure will be provided.

- ***Surface water sampling 3.a., page 16***

The discussion regarding reporting limits (RLs) and frequency of detection needs to be

incorporated into the BERA and also included in the uncertainty discussion.
Response: EPA would like an acknowledgement that where reporting limits exceed benchmarks for non-detects, there is uncertainty added to the assessment.

Additionally, EPA wishes to comment on the statement “*Current site activities are not contributors of contaminants to the ponds.*” While this may be true, it is important to note that “current and future risk potential” is being assessed, as opposed to “historical versus current practices”.

Notes: The parties do not currently agree that a comparison of “historical” versus “current” practices is a component of the Consent Order, which was entered into to formalize EPA’s audit of historical site practices only. The parties and their counsel will discuss this issue further.

Finally, the last sentence of this section on page 16 states “*Historic sediment contamination that remains in the ponds is located within the organic rich pond sediments, which have a strong tendency to adsorb contaminants and therefore not be a significant source of contamination to surface water.*” Note that unless proven by testing and actual data, this point is not defensible on its own.

Notes: We agreed that the proposed assessment will provide the data for reaching risk conclusions.

- **Surface Water sampling 3.b., page**

- i. Upper Shoe Pond** – This proposal states 4 samples but Figure 7 shows 12 locations. Please clarify and correct as appropriate.

- Notes: The figure labelling will be clarified and made consistent with the tables.*

- ii. Lower Shoe Pond** - This proposal states 4 samples but Figure 6 shows 3 locations. Additional sample locations in the southeast quadrant of the pond and just behind the impoundment are needed.

- Notes: The figure labelling will be clarified and made consistent with the tables.*

- iii. Upstream samples** – EPA recommends that surface water background samples for the ponds be collected from the Bass River between Colgate Road and the golf course property. Recognizing a second input to Lower Shoe Pond, sampling at the point of discharge to Lower Shoe may be the only choice to provide information on this particular background input from North Beverly Brook Drainage System. Note that the Upper Shoe Pond does not appear to be influenced by the North Beverly Brook Drainage System.

- Notes: We asked how the proposed background sample locations were selected. EPA stated that the locations were chosen by EPA’s eco risk assessor. We discussed the potential that private property owners may refuse access. EPA acknowledged that such refusal was possible and suggested that we make an*

effort to gain access. We agreed. The parties will re-visit the issue if access to the upstream locations suggested by EPA were to be denied in whole or part.

iii.3. EPA does not recommend sample collection from the discharge point during a wet weather event because it would not reflect a general surface water characterization but rather a single higher concentration flush event.

Notes: Agreed.

- ***Surface Water Analytes, 3.c., page 17***

Both total and dissolved analyses should be listed here.

i. Hardness will be used to normalize metals to hardness to adjust Ambient Water Quality Criteria (AWQC), Criterion Continuous Concentration (CCC) values.

Notes: It was acknowledged that for hardness-dependent CCC's, comparisons to benchmarks would be based on hardness-adjusted values.

ii, iii, iv and v. These parameters are not needed in the risk assessment.

Notes: Agreed.

- ***Sediment Sampling (a), page 17***

Assuming the substrate is amenable, a coring technique which will minimize any "washing" of sample fines should be used rather than a dredge.

Notes: We discussed concerns with coring technique for sample collection, particularly in the Upper Pond (deeper, soft sediments). The parties agreed that a closed-top sampler (Eckman or petite ponar) will be sufficient, as it retains most fines. Two gallons of sediment is required for each test organism at each sample location.

EPA expects that only underwater sediment samples be used to assess aquatic biota. Use of sediment samples that are exposed for an ingested sediment component to food-chain modeling exposure is reasonable.

Notes: Acknowledged.

- ***Sediment Sampling (b), page 17 & 18***

i. Figure 7 shows only 3 sample locations. One sample should be located in the north-east cove and another where it says "Shoe Pond" in the Figure. An additional sample should be located $\frac{3}{4}$ of the way down heading from north to south, in the middle of the Shoe Pond.

Notes: Figures and lists of proposed samples will be updated.

ii. Figure 6 shows 4 sample locations. Two more samples are needed. One sample should be located south-east (approximate to where a surface water location is being designated), and one sample location directly behind the impoundment.

Notes: Figures and lists of proposed samples will be updated.

b.iii. For sediment, in order to characterize non-site conditions, EPA suggests samples for pond sediment be taken from Norwood Lake, south of Dodge Street, Beaver Pond south-east of Norwood Lake, and Kelleher's Pond off Route 22 near the YMCA (as opposed to the golf course). EPA also wishes to note that the intention of background sampling is not only to characterize any immediate non-site sources but also to characterize the more ubiquitous local pond sediment environment.

Notes: EPA will explain rationale for selection of these suggested off-site sample locations.

iv. PCBs (Homologs) – EPA recommends that analysis for Arochlors for all samples be conducted and a 10% subset for homologs to assess PCB total differences between Arochlor and homolog analytical techniques.

Notes: We noted that standards are based on total PCBs. EPA acknowledged that analysis of Arochlors can be useful for determining the source (site-related vs non-site-related) but recognized that if historical data regarding on-site use of PCBs is not available, then homolog analysis would be sufficient.

vii. – AVS/SEM – This analysis should only be performed if sampling is performed in the winter months (i.e., November – March) or any results will have a seasonality uncertainty risk component. AVS/SEM results are only to be used in conjunction with interpretation of toxicity testing and are not to be considered on its own to be a predictive measurement of risk potential.

Notes: EPA expressed its opinion that a stronger weight of evidence would be placed on toxicity test results, especially if AVS/SEM results are collected in warm weather.

- **Toxicity Testing, page 18**

This testing is best considered later in the investigation once the substrate physical and chemical data is reviewed. Bulk toxicity testing is primarily intended to identify the presence of toxicity and not the actual causative agents involved.

Notes: Please see above notes regarding the proposed collection of co-located chemistry and toxicity samples.

Note that laboratory test controls are used to identify any issues with the conduct of the test or health of the test organisms. A statistical comparison is to be made for all endpoints between site impacted samples and acceptable test reference samples. It is this latter comparison that will help define site and non-site related risk.

Notes: The laboratory proposed for this work statistically compares the site samples with the lab control and with any site controls (e.g., off-site samples suggested by EPA).

- **Food chain modelling, page 19**

Understanding this is an example, while the muskrat is an herbivore, the duck (i.e., black duck) and the heron should be modeled consuming almost exclusively invertebrates and fish, respectively.

Notes: It was agreed that modelling would be based on biology; i.e., actual diet of modelled receptor organisms.

- **First equation – Exposure Dose, page 19**

While it is certainly acceptable to include water consumption, Cummings may want to consider eliminating the surface water consumption component of the model in the interest of time. A significant component of risk is unlikely from surface water consumption.

Notes: EPA confirmed that inclusion and exclusion of water consumption for the food chain model are acceptable.

- **Report, page 20**

At this point in the plan there are other very important aspects of the ERA that should be presented for both surface water and sediment:

Notes: This additional clarification will be provided.

1. Details of the COC and COPEC selection process.
2. Benchmark comparisons against observed site maximum concentrations.
3. Calculation of hazard quotients (HQs); including “no effect” benchmarks, “low effect” benchmarks, and how the site HQ compares within that “no effect” range, etc.
4. Comparison against background concentrations, including how the incremental risk (IR) is going to be calculated (i.e., the separation of site related and non-site related risk) and the percentage of site risk/total risk to be considered "actionable."

Notes: Please see item 5, below

5. How the various lines of evidence (i.e., chemical analysis, toxicity testing, AVS/SEM and food chain modeling), will be weighed against each other to summarize risk.

Notes: The weight of each line of evidence will be assigned based upon a number of factors, including some that are not known at this time. For example, a very small exceedance of a standard would receive a lower weight than a very large

exceedance of the same standard. Similarly, QC issues that may or may not arise will affect the weight assigned to a particular line of evidence.

6. How any statistical representation of results will be considered as reflecting actionable risk.

Notes: A weight of evidence approach, rather than reliance upon any statistical cutoff, will be utilized to determine if risk requiring action exists. Standard statistical confidence assessment will be included in the toxicity testing, and the results of that assessment will be incorporated into the weight assigned to such line of evidence.

- ***Health and safety and timing provisions, page 20***

Fully understanding safety considerations, remember that unless AVS/SEM data is collected in the winter months (i.e., November-March), there is even further uncertainty of predictive power with any AVS/SEM modeling results.

Notes: Acknowledged.

Form L: Analytical Precision and Accuracy, page 36

- ***Table, Page 36***

Can it be assumed that the soil RL would be synonymous with sediment RL? It is understood that media specific RLs are based on the % moisture of the sample. Because the benchmarks for sediment are based on dry weight, EPA recommends that you either use the % moisture from the previous sampling events to estimate the proposed RLs or collect a sample or two to determine % moisture and use those values to calculate dry weight basis RLs.

Notes: EPA asked to be sent the methods.

- ***Table, Page 50***

EPA suggests that homologs be analyzed as a subset of the samples and that all samples be analyzed for Arochlors. This suggestion is intended to allow for the verification of the calculation of total PCBs using individual Arochlor results. In addition, only Arochlors were analyzed for in the past and if Cummings will be using homologs then the appropriate homologs will need to be identified.

Notes: This suggestion will be incorporated into the BERA.

- ***Figure 6, Approximate Sediment and Surface Water Sampling Locations in Lower Shoe Pond & Figure 7, Approximate Sediment and Surface Water Sampling Locations in Upper Shoe Pond.***

Sample numbers shown in these figures are not consistent with the proposed number in the sampling plans above. Refer to the above previous comments regarding the same.

Notes: The figures and lists of proposed samples will be updated.

- **Table 1. Surface Water Analytical Results - 2011 Samples Collected from Upper and Lower Shoe Ponds**

In the case of surface water, the 2011 data set is too small, particularly for the Upper Shoe Pond. While some of the benchmarks should be lower, the reporting limits are generally acceptable. Regardless, an 8-year-old data set is too old to make any confident statements about current or future risk potential.

EPA recommends that new surface water samples be collected (6 instead of the 4 proposed in Upper Shoe Pond) and analyzed for the following, using the appropriate analytical techniques to obtain the chronic benchmarks identified in EPA Region 4's 2015 ERA Supplemental Guidance:

Notes: The figures and lists of proposed samples will be updated.

1. SVOCs (Method 8270);
2. Total and Dissolved 13 priority pollutant metals,

Notes: Water Quality Criteria are based on dissolved metals concentrations. EPA confirmed that analysis of dissolved metals (only) is acceptable.

3. EPH (MassDEP Method)
4. VOCs – at a minimum, in the south-east corner of the Upper Shoe Pond.

Notes: We questioned the need to analyze VOCs, given the lack of VOC concerns on the site generally and the low likelihood of finding VOCs in surface water under all but the most extreme VOC contamination inputs (which do not occur on this site). EPA confirmed it would discuss the issue internally and reconsider.

Furthermore, EPA wishes to comment on the following analytical results:

1. Acenaphthylene – The screening benchmark is too high. Refer to the Region 4, 2015 ERA Supplemental Guidance which says 13 ppb.

Notes: The table will be revised.

2. Acenaphthene – The screening benchmark is too high. Refer to the Region 4, 2015 ERA Supplemental Guidance which says 15 ppb.

Notes: The table will be revised.

3. Overall it appears the RLs and benchmarks are appropriate for SVOCs, but EPA

suggests that a check be run against the EPA Region 4, 2015 ERA Supplemental Guidance tables to check the RLs and benchmarks against the surface water chronic values.

Notes: The check will be conducted.

4. Lead – The reporting limit is too high compared to the benchmark of 1.17.

Notes: We agreed that subject to laboratory quantification constraints, we will attempt to achieve reporting limits down to the benchmark.

Standard Operating Procedure: Sediment Collection for Environmental Samples Rev: 7/2/2018,

- ***Equipment, page 1 of 5***

For this investigation, for reasons stated previously, the first choice for sediment sampling is a coring technique. Dredging should be avoided. Use of a scoop, trowel or shovel is not acceptable unless there is no surface water at the sampling location.

Notes: Please see notes regarding dredging above. Scoops, trowels, and shovels will not be utilized in standing water. No agreement was reached on the practicality of core sampling, particularly for collection of toxicity testing samples.

- ***Sediment Exposed Above Standing Water, page 2 of 5***

Collection of these samples is expected only in the case where the extent of contamination is being determined or the sample is being used for incidental ingestion in food chain modeling.

Notes: We intend to eliminate these types of samples, as EPA does not prefer them.